CLAIMS

1. A strip (3) to be inserted between two elements (1, 2) in order to cause acoustic attenuation of the noise propagating through at least one of the elements, the strip (3) being formed from at least one plastic-based damping material i, characterized in that the strip (3) has an equivalent real stiffness per unit length K'_{eq} equal to at least 25 MPa and an equivalent loss factor $\tan\delta_{eq}$ equal to at least 0.25.

2. The strip as claimed in claim 1, characterized in that it has an equivalent real stiffness per unit length K'_{eq} of between 30 MPa and 270 MPa and an equivalent loss factor $\tan\delta_{eq}$ equal to at least 0.4.

3. The strip as claimed in either of the preceding claims, characterized in that the strip (3) is formed from a single damping material (4) or from several damping materials (4a, 4b; 40, 41; 42, 43; 44, 45; 46, 47).

4. The strip as claimed in claim 3, characterized in that the damping material or materials exhibit adhesion properties with respect to the two elements (1, 2).

5. The strip as claimed in claim 1 or 2, characterized in that the strip (3) is formed from at least one damping material (4) and from a nondamping adhesive material, the adhesive material being designed to bond the two elements (1, 2) together.

6. The strip as claimed in claim 5, characterized in that the adhesive material (5) adheres via two opposed faces (50, 51) to the two elements (1, 2) respectively, the damping material being bonded to at least one of the two elements.'

7. The strip as claimed in claim 5, characterized in that the adhesive material (5) adheres via one of its faces (50) to the damping material (4) that is bonded to one of the elements (1) and adheres via its opposite face (51) to the other element (2) to be joined together.

8. The strip as claimed in any one of claims 3 to 7, characterized in that the strip (3) comprises several damping materials (4a, 4b; 40, 41; 44, 45; 46, 47) placed as a stack of layers one on top of another, each of the materials at the ends of the stack being bonded to one of the two elements (1, 2) to be joined together or to the adhesive material (5).

9. The strip as claimed in any one of claims 3 to 7, characterized in that the strip (3) comprises several damping materials (4c, 4d; 42, 43) placed in juxtaposition one beside another, butted together or otherwise, each of the

materials having two opposed surfaces bonded to the two elements (1, 2) to be joined together, respectively.

10. The strip as claimed in claims 8 and 9, characterized in that the strip (3) comprises several damping materials placed as a stack and in juxtaposition, at least one or two materials partly constituting this combination being bonded to the two elements (1, 2) to be joined together.

11. The strip as claimed in one of claims 5 to 10, characterized in that the adhesive material (5) is placed so as to be stacked with and/or in juxtaposition with the damping material or materials.

12. The strip as claimed in any one of claims 5 to 11, characterized in that the damping material or materials, together or with the adhesive material (5), are separated by an air space (6).

13. The strip as claimed in any one of claims 5 to 12, characterized in that the nondamping adhesive material (5) is a polyurethane mastic having a Young's modulus E' of 21 MPa and a loss factor $\tan\delta$ of 0.2.

14. The strip as claimed in any one of the preceding claims, characterized in that the damping material or materials are chosen from the following plastics: plasticized or unplasticized polyvinyl chloride; thermoplastic elastomers; one-component or two-component polyurethanes possibly modified by an elastomer, such as polyolefins, EPDM (ethylene-propylene-diene) or rubber, especially butyl rubber or nitrile rubber or else styrene-butadiene rubber; polyalkyl acrylate or methacrylate copolymers; and epoxy resins.

15. The strip as claimed in claim 15, characterized in that the plastic contains organic or mineral fillers, such as talc, silica, calcium carbonate, kaolin, alumina, molecular sieve, carbon black, graphite and pyrogenic silica, or metal fillers.

16. The strip as claimed in claim 15, characterized in that the damping material is a one-component polyurethane that has an NCO percentage content of between 0.5 and 2% and comprises:

- at least one polyesterpolyol with a functionality of two (preferably between 80 and 200 g), having an OH index iOH of between 5 and 10, a glass transition temperature T_g of -50°C or below and a softening point between 50 and 80°C;

- at least one polyesterpolyol with a functionality of two (preferably between 120 g and 220 g), having an index iOH between 50 and 100 and a glass transition temperature T_g of -50°C or below;

- at least one isocyanate with a functionality of between 2.1 and 2.7 of the diphenylmethane diisocyanate (MDI) type and having an NCO percentage content of between 11 and 33% (preferably between 180 and 220 g);

- at least one catalyst (preferably between 0.5 and 3 g);

- optionally, a filler of the molecular sieve type (preferably between 20 and 60 g); and

- optionally, at least one filler of the chalk, kaolin, talc, alumina, carbon black or graphite type (preferably between 5 and 60 g).

17. The strip formed from the single damping material as claimed in claim 17, characterized in that it has, at 20°C, with a reference cross section of 15 mm in width and 3 mm in thickness, an equivalent real stiffness per unit length of 400 MPa and an equivalent loss factor of 0.3.

18. The strip as claimed in claim 15, characterized in that the damping material is a one-component polyurethane that has an NCO percentage content of between 0.5 and 2% and comprises:

- at least one polyesterpolyol with a functionality of two (preferably between 350 and 450 g), having an OH number between 20 and 40 and a glass transition temperature T_g of between -40 and -20°C;

- at least one polyesterpolyol with a functionality of two, having an OH number between 30 and 90 (preferably between 35 and 250 g), a glass transition temperature T_g between 0 and 30°C and a softening point between 50 and 70°C;

- at least one isocyanate having a functionality between 2.1 and 2.7 of the diphenylmethane diisocyanate (MDI) type and an NCO percentage content of between 11 and 33% (preferably between 150 and 230 g);

- at least one catalyst (preferably between 0.5 and 3 g);

- optionally, a filler of the molecular sieve type (preferably between 20 and 80 g); and

- optionally, at least one filler of the chalk, kaolin, talc, alumina, carbon black or graphite type (preferably between 5 and 60 g).

19. The strip formed as a stack of the damping material as claimed in claim 19 and of a nondamping adhesive material of the polyurethane mastic type,

characterized in that it has, at 20°C, with a cross section of 15 mm in width and 3 mm in thickness for each of the two materials, an equivalent real stiffness per unit length of 70 MPa and an equivalent loss factor of 0.95.

20. The strip as claimed in claim 15, characterized in that the damping material is a polyurethane prepolymer that has an NCO percentage content of between 0.5 and 2%, the material comprising:

- at least one polyetherpolyol with a functionality of two, having an index iOH of between 25 and 35, a glass transition temperature T_g below -50°C and a molecular mass between 3500 and 4500;
- at least one polyetherpolyol with a functionality of between 2.3 and 4, having an index iOH between 25 and 800 and a glass transition temperature T_g below -50°C;
- at least one polyesterpolyol with a functionality of two, having an index iOH between 20 and 40 and a glass transition temperature T_g between -40 and -20°C;
- at least one polyesterpolyol with a functionality of two, having an index iOH between 30 and 90, a glass transition temperature T_g between 0 and 30°C and a softening point between 50 and 70°C;
- at least one isocyanate with a functionality of between 2.1 and 2.7 of the diphenylmethane diisocyanate (MDI) type and an NCO percentage content between 11 and 33%;
- at least one catalyst;
- optionally, a filler of the molecular sieve type; and
- optionally, a filler of the chalk, kaolin, talc, alumina, carbon black or graphite type.

21. The strip as claimed in claim 20, characterized in that it comprises, the NCO % content being between 1.8 and 2.2%:

- between 180 and 220 g of a polyetherpolyol with a functionality of two, having an index iOH between 25 and 35, a glass transition temperature T_g below -50°C and a molecular mass between 3500 and 4500;
- between 75 and 115 g of an isocyanate of the MDI type having an NCO % content equal to 11.9%;
- between 5 and 30 g of carbon black;
- between 0.5 and 3 g of catalyst;

- between 10 and 30 g of pyrogenic silica;
- between 135 and 180 g of a liquid and amorphous polyesterpolyol A with an index iOH between 27 and 34, a molecular mass of 3500, a functionality of two and a glass transition temperature T_g of -30°C;
- between 35 and 85 g of a liquid and amorphous polyesterpolyol B with an index iOH between 27 and 34, a molecular mass of 3500, a functionality of two and a glass transition temperature T_g of +20°C, respectively;
- between 55 and 110 g of an MDI-type isocyanate, with an NCO % content of 11.9%; and
- between 20 and 80 g of molecular sieve.

22. The strip formed from the single damping material as claimed in claim 20 or 21, characterized in that it has, at 20°C, with a reference cross section of 15 mm in width and 3 mm in thickness, an equivalent real stiffness per unit length of 120 MPa and an equivalent loss factor of 0.75.

23. The strip as claimed in any one of the preceding claims, characterized in that it is applied to at least one of the elements by a process of extrusion, and/or of encapsulation, and/or of transfer from a molding, and/or of injection molding.

24. The strip as claimed in any one of the preceding claims, characterized in that the strip has a uniform or nonuniform cross section over all or part of its length.

25. The strip as claimed in any one of claims 1 to 21, characterized in that it is joined to two elements (1, 2) of the metal-metal, glass-glass, metal-plastic, plastic-glass or plastic-plastic type.

26. The strip as claimed in claim 22, characterized in that it is inserted between a glass substrate and a metal element so as to be used for attaching the substrate to the metal element.

27. The strip as claimed in claim 23, characterized in that it is used for the attachment of glazing to the body of a motor vehicle.

28. The strip as claimed in claim 24, characterized in that the glazing consists of a laminated glazing assembly comprising at least two glass sheets and a film with acoustic properties.

29. A method of evaluating the acoustic damping properties of a strip designed to be inserted between two elements formed from at least one damping material i, characterized in that it consists in evaluating the equivalent real stiffness per unit length K'_{eq} of the strip and the equivalent loss factor $\tan\delta_{eq}$, the strip having acoustic damping properties when the equivalent real stiffness per unit length is at least equal to 25 MPa and the equivalent loss factor is at least 0.25.

30. The method as claimed in claim 26, characterized in that the evaluation of the equivalent real stiffness per unit length K'_{eq} of the strip and of the equivalent loss factor $\tan\delta_{eq}$ comprises steps of measuring the Young's modulus E_i' and the loss modulus E_i'' of each constituent material i of the strip and steps of calculating using the formulae:

$$\left[K_{eq}^{*}\right]^{\alpha} = \sum\left[K_{i}^{*}\right]^{\alpha} \qquad (1)$$

$$K^{*}_{i} = E^{*}_{i} \times \frac{L_i}{e_i} \qquad (2)$$

$$\tan\delta_{eq} = \frac{K_{eq}''}{K_{eq}'} \qquad (3)$$

where L_i and e_i are the width and the thickness of the material, respectively.

31. The method as claimed in claim 27, characterized in that the Young's modulus E_i' and the loss modulus E_i'' of each constituent material i of the strip are measured by means of a viscoanalyzer.

32. The method as claimed in claim 26, characterized in that the viscoanalyzer is used to make direct measurements of the equivalent real stiffness k'_{eq} and the equivalent loss modulus k''_{eq} of a strip specimen with a cross section identical to that of the strip and with a length L and then the following are calculated:

- the ratio of the measured equivalent real stiffness to the length L in order to obtain the equivalent real stiffness per unit length K'_{eq} of the strip: $K'_{eq} = k'_{eq}/L$; and
- the ratio of the measured equivalent loss factor to the measured equivalent real stiffness in order to obtain the equivalent loss factor $\tan\delta_{eq}$ of the strip: $\frac{k_{eq}''}{k_{eq}'}$.